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10/808,698	03/25/2004	Chun Hua Yang	121812.00006	5893

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EXAMINER	
SINGH, HIRDEPAL	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/808,698	YANG ET AL.	
	Examiner	Art Unit	
	HIRDEPAL SINGH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on January 04, 2008. Claims 1-19 are pending and have been considered below.

Response to Arguments

2. Applicant's amendment has corrected the informalities in the specification as suggested. Therefore, the objection to the specification is withdrawn.

3. Amendment has corrected the informalities in claim 18 as suggested. Therefore, the objection to claim 18 is withdrawn.

4. Applicant's arguments filed January 04, 2008 have been fully considered but they are not persuasive.

5. Applicant argues "...Mueller provides a detector that is independent of frequency offset, whereas the present invention develops that term and then processes it ... Referring to paragraphs 14 and 15, which were cited in the Office action, these refer to two different types of known systems which Mueller considered to be background art to his invention ..." and further says that claim 1 recites "a frequency offset sensor arranged to sense an envelope of the demodulated signal to provide an offset signal indicative of a frequency offset of the input signal.. Mueller does not isolate and process such a frequency offset signal, so there is no anticipation as determined in the Office action. As to obviousness Mueller teaches away from the solution of the present invention per the comments cited above."

6. Examiner respectfully traverses Applicant's opinion as Mueller clearly suggests a system that is more robust against frequency offset (paragraph 0024) i.e. the system is capable of dealing with the frequency offset present, and further suggests that the detector of Mueller is capable to be used with frequency offset (paragraph 0025).

7. Examiner respectfully traverses Applicant's opinion i.e. Mueller teaches away as according to the MPEP 2123 [R-5]

> II. **NONPREFERRED AND ALTERNATIVE EMBODIMENTS CONSTITUTE PRIOR ART**
>
> Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi,* 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) (The invention was directed to an epoxy impregnated fiber-reinforced printed circuit material. The applied prior art reference taught a printed circuit material similar to that of the claims but impregnated with polyester-imide resin instead of epoxy. The reference, however, disclosed that epoxy was known for this use, but that epoxy impregnated circuit boards have "relatively acceptable dimensional stability" and "some degree of flexibility," but are inferior to circuit boards impregnated with polyester-imide resins. The court upheld the rejection concluding that applicant's argument that the reference teaches away from using epoxy was insufficient to overcome the rejection since "Gurley asserted no discovery beyond what was known in the art." 27 F.3d at 554, 31 USPQ2d at 1132.). Furthermore, "[t]he prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

"...The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit , or otherwise discourage the solution claimed..." As in the present case Mueller discloses that the differential detector as suggested produces better

results when used with different techniques and can be used with frequency offset scenario in the system and the advantages of the system as compared to the prior detectors (paragraphs 0024-0025).

8. Applicant argues, regarding claim 19 "... filter 34 performs a filtering operation and a smoothing operation in which the inputs to the filter are smoothed and the number of samples on the time base is reduced within the range that meets the Nyquist sampling thereon... This is not a disclosure of a filter having a bandwidth which varies as a function of time. A bandwidth of a filter defines the range of frequencies which the filter is configured to pass. It does not relate to the number of samples of the filter..."

9. Examiner respectfully traverses applicant's opinion, The Applicant(s) is/are reminded that the rejection is made based on the entire content of the cited prior art.

10. Mueller teaches a filter processing a signal with predetermined frequency and Suzuki discloses that the filter output signal is based on the equation 19 in column 9, that is based on filter function and time sequence which is delayed and multiplied based on the sampling time periods (column 9, lines 20-61) and where the filter smoothing process is adaptable. Therefore, the arguments offered by the applicant are not persuasive in view of above explanations and the rejection to claims 1-19 is upheld.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Mueller et al. (US 2002/0122509).

Regarding claim 1:

Mueller et al discloses a differential detector (abstract) comprising:

a frequency converter arranged to convert an input signal into a demodulated baseband signal (figure1; 164 in figure 8);

a sampling stage (67, 69 in figures 4-5 and 8) arranged to sample said demodulated baseband signal at a sampling frequency to provide a sampled signal;

a demodulator (62 in figures 4 and 8) arranged to demodulate the sampled signal to provide a demodulated signal; and

frequency offset sensor (64 and 66 in figure 4) arranged to sense an envelope of the demodulated (paragraphs 0014-0015, and 0024-0025) signal to provide an offset signal indicative of a frequency offset of the input signal.

Regarding claim 18:

Mueller et al discloses all of the subject matter as described above and further discloses that the demodulated baseband signal and the sampled signal comprise two signal components in phase quadrature (figures 4-5).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (US 2002/0122509) in view of Suzuki et al. (US 5,907,585).

Regarding claim 19:

Mueller et al discloses a differential detector (abstract) comprising:

a frequency converter arranged to convert an input signal into a demodulated baseband signal (figure1; 164 in figure 8);

a sampling stage (67, 69 in figures 4-5 and 8) arranged to sample said demodulated baseband signal at a sampling frequency to provide a sampled signal;

a demodulator (62 in figures 4 and 8) arranged to demodulate the sampled signal to provide a demodulated signal.

Mueller et al discloses all of the subject matter as described above except for specifically teaching a filter arranged to filter the demodulated signal to provide a filtered signal indicative of a frequency offset of the input signal and wherein the filter is arranged to have a bandwidth which decreases as a function of time.

However, Suzuki et al in the same field of endeavor discloses a system and method for digital signal detection where a filter (34 in figures 3 and 7) arranged to filter the demodulated signal and filter output signal is based on the equation 19 in column 9, that is based on filter function and time sequence which is delayed and multiplied based on the sampling time periods (column 9, lines 20-61) and where the filter smoothing

process is adaptable i.e. filter is arranged to have adaptable bandwidth (column 4, lines 43-67; column 8, lines 64-67; column 9, lines 1-10).

Therefore, it would have been obvious to one of ordinary sill in the art at the time of invention to implement the teachings of Suzuki in the Mueller system for using a filter with adaptable function and bandwidth i.e. filter having bandwidth varies as function of time, for filtering demodulated signal which is indicative of frequency offset of input signal to obtain smoothed time sequence signal to get the better estimate of frequency offset.

15. Claims 2-6 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (US 2002/0122509) in view of Fujimura et al. (US 6,650,718).

Regarding claim 2:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that sensing means comprises: a tracker to track the envelope of said demodulated signal from said demodulator and provide a tracking signal; and a filter arranged to low pass filter the tracking signal to provide the offset signal.

However, Fujimura et al in the same field of endeavor discloses means arranged to track the envelope (column 1, lines 52-65) of said demodulated signal from said demodulator (figure 17 and 22) and provide a tracking signal; and a filter arranged to low pass filter (column 11, lines 36-46; column 24, lines 34-42) the tracking signal to provide the offset signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use Fujimura envelop tracker and filter arrangement in the Mueller system to get filtered output of demodulator to get a tracking signal and to get the offset signal so that the output gives required information about the frequency offset.

Regarding claim 3:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that filter is an adaptive II R filter.

However, Fujimura et al in the same field of endeavor discloses system for differential detection where the filter is an adaptive II R filter (column 26, lines 12-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a filter is an adaptive IIR filter as the IIR filters are fast in operation and are inexpensive so make the system performance fast and accurate while keeping the cost low.

Regarding claim 4:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that sensing means further comprises a filter coefficient generator.

However, Fujimura et al in the same field of endeavor discloses system for differential detection where sensing means further comprises a filter coefficient generator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a coefficient generator for the filter in order to adjust the tracking channel reference during acquisition and reduce loop gain optimally.

Regarding claim 5:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that filter coefficient generator reduces the filter coefficient as a function of time.

However, Fujimura et al in the same field of endeavor discloses system for differential detection where filter coefficient generator reduces the filter coefficient as a function of time (column 11, lines 36-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a coefficient generator for the filter in order to adjust the tracking channel reference during acquisition and reduce loop gain optimally.

Regarding claim 6:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that filter coefficient generator adjusts the coefficient of filter according to the following: $\alpha n = (31/32)\ \alpha n - 1 + (1/32) * (1/256)$ wherein αn is the filter coefficient at time n, $\alpha n-1$ is the filter coefficient at time n-1.

However, Fujimura et al in the same field of endeavor discloses system for differential detection where the filter coefficient generator adjusts the filter coefficient according to the given equation (column 26, lines 12-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a coefficient generator for the filter in order to adjust the tracking channel reference during acquisition and reduce loop gain optimally.

Regarding claims 14 and 16:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the sensing means is arranged to sense the envelope of the demodulated signal by making the following determinations:

if Xn < Xn_1 > Xn_2 and Xn_1 > Min + threshold and Xn_1 < MAX,

And if Xn_1 > Max or Xn_1 > dc. n_1, then Max = Xn_1

if Xn > Xn_1 < Xn_2 and Xn_1 Max-threshold and Xn_1 >-MAX,

And if Xn_1 < Min or Xn_1 <dc. n_1 , then Min = Xn_1

However, Fujimura et al in the same field of endeavor discloses means arranged to track the envelope (column 1, lines 52-65) of said demodulated signal from said demodulator (figure 17 and 22) and provide a tracking signal; and a filter arranged to low pass filter (column 11, lines 36-46; column 24, lines 34-42) the tracking signal to provide the offset signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to arrange a filter at output of demodulator to get the envelop of the demodulated signal based on the timing of the sampled signal as described in order to get the information that which edge of the signal is detected and tracking the offset signal so that the output gives required information about the frequency offset.

Regarding claim 15:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the threshold and MAX are proportional to a sampling duration, a modulation index or amplitude of the demodulated signal.

However, Fujimura et al in the same field of endeavor discloses means arranged to track the envelope (column 1, lines 52-65) of said demodulated signal from said demodulator (figure 17 and 22) and it is well known that to check if the signal is with in a limit it is to be compared with a threshold and MAX values which is proportional to the deciding factor e.g. a sampling duration, a modulation index or amplitude of the demodulated signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to arrange a filter at output of demodulator to get the envelop of the demodulated signal based on the timing of the sampled signal as described in order to get the information that which edge of the signal is detected and tracking the offset signal so that the output gives required information about the frequency offset.

Regarding claim 17:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that filter is arranged to calculate a component of the offset signal of the form: dc. = (1 - αn) dc n_1 + αn/2 (Max + Min); where, dcn is said frequency component of said input signal at time n, dcn-1 is said frequency component at time n-l, and αn is a coefficient of the filter at time n.

However, Fujimura et al in the same field of endeavor discloses means arranged to track the envelope (column 1, lines 52-65) of said demodulated signal from said demodulator (figure 17 and 22) and it is well known that to check if the offset signal component is according to a defined format as above.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to arrange a filter at output of demodulator to get the envelop of the demodulated signal based on the timing of the sampled signal as described in order to get the information that which edge of the signal is detected and tracking the offset signal components so that the output gives required information about the frequency offset.

16. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (US 2002/0122509) in view of Nguyen (US 6,566,919).

Regarding claim 8:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that sensing means further comprises a reset signal generator arranged to detect the start of input data transmission and reset the sensing means.

However, Nguyen in the same field of endeavor discloses system and method for reset signal generator (abstract; figure 1) arranged to detect the start of input data transmission and reset the sensing means.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a reset signal generator with the sensing means in order to detect the start of the input data for making the correct decision about the frequency offset so the required compensation can be done.

Regarding claim 9:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that generator is arranged to detect signal power to detect the start of transmission.

However, Nguyen in the same field of endeavor discloses system and method for reset signal generator (abstract; figure 1) arranged to detect the signal power (column 2, lines 4-26) to detect the start of transmission.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a reset signal generator with the sensing means in order to detect the power of the input signal to check the start of the input data for making the correct decision about the frequency offset so the required compensation can be done.

Regarding claim 10:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the demodulator comprises power normalizing means arranged to generate a power signal from the sampled signal and provide a normalized demodulated signal to the generator.

However, Nguyen in the same field of endeavor discloses system and method for reset signal generator (abstract; figure 1) arranged to detect the signal power (column 2, lines 4-26) and the normalizing power means (column 5, lines 16-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a reset signal generator with the sensing means in order to detect the power of the input signal to check the start of the input data for making the correct decision about the frequency offset.

17. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (US 2002/0122509) in view of Magill (US 5,729,570).

Regarding claim 11:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the demodulator includes power normalizing means arranged to generate a power signal from the sampled signal and provide a normalized demodulated signal to the sensing means.

However, Magill in same field of endeavor discloses a system and method for detection of signal where it generate a power signal from the sampled signal and provide a normalized demodulated signal to the sensing means (figures2-4; column 3, lines 38-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the teachings of Magill into Mueller to generate power signal from samples signal and provide to sensing means to obtain decisions outputs by normalizing the signal by taking the sign bit off.

Regarding claim 12:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the sensing means further comprises a comparator arranged to compare said demodulated signal with a threshold provided by the offset signal to provide an output signal.

However, Magill in same field of endeavor discloses a system and method for detection of signal where a comparator (figure 8) arranged to compare said demodulated signal with a threshold provided by the offset signal to provide an output signal (column 5, lines 65-67; column 6, lines 1-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the teachings of Magill into Mueller to generate output signal from the comparison of demodulated signal with a threshold signal to check if the level of the signal is within the specified limit in order to keep the system working under control within the specified limits.

Regarding claim 13:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that the comparator provides a logical "1" output if said demodulated signal is larger than the threshold and otherwise output logical "0".

However, it is well known in the art that when a decision is made based on the comparison of a signal with a threshold signal the output of the comparison is in the form of a logical signal i.e. logic 1 or 0 in the digital form so that based on that output a decision can be made whether the signal is within required limit or not.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement a comparator that provides a logical "1" output if said demodulated signal is larger than the threshold and otherwise output logical "0" in order to make the decision whether the demodulated signal is with in the limit or not.

18. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al. (US 2002/0122509) in view of Fujimura et al. (US 6,650,718) as applied to claim 2 above, and further in view of Kroeger et al. (US 6,895,060).

Regarding claim 7:

Mueller et al discloses all of the subject matter as described above except for specifically teaching that filter has a bandwidth which decreases as a function of time.

However, Kroeger et al in the same field of endeavor discloses system for differential detection where filter has a bandwidth which decreases as a function of time (column 5, lines 48-56; column 6, lines 40-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a coefficient generator for the filter in order to adjust the tracking channel reference during acquisition and reduce loop gain optimally.

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571)270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off)8:00AM-5:00PMEST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. S./
Examiner, Art Unit 2611
March 18, 2008
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611